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U. S. DEPARTMENT OF AGRICULTURE--FOREST SERVICE
PACIFIC SOUTHWEST FOREST AND RANGE EXPERIMENT STATION
Division of Forest Insect Research

PANDORA MOTH CONDITIONS
LAGUNA MOUNTAIN
CLEVELAND NATIONAL FOREST
APPRAISAL SURVEY

INTRODUCTION

On September 16, 1959, a detection report No. 368-59 was received from Ranger E. G. Heilman of the Descanso District of the Cleveland National Forest stating that "last two weeks of August 1959 thousands of adult large nocturnal moths seen in the timbered portion of the Laguna area, disappeared by September 15, 1959." These were thought to be the pandora moth, Coloradia pandora Blake. Subsequently, a similar report No. 369-59 was received from the Cuyamaca Rancho State Park with essentially the same information.

The records for the Station show that the pandora moth was reported from the Laguna area in 1940 and again in 1956 and 1957. In the fall of 1957, on October 12, the eggs of the moth were found by C. B. Eaton to be fairly abundant at Mt. Laguna. A few of the eggs had hatched at that time and small numbers of young larvae were present in the field, but most had not. Evidently the larvae did not become numerous enough to cause noticeable damage the following year, for no infestations were reported in 1958.

On March 14, 1960, another detection report (No. 68/60) was received from J. W. Peterson of the Descanso District indicating that the young larvae were quite prevalent in the Laguna area. The caterpillars were found on 6 out of 20 trees examined. Following this on March 29, specimens of larvae were submitted to the Station. On April 13, R. C. Ball from the Station and J. R. Pierce from the San Bernardino Forest, visited the Laguna area with J. W. Peterson and made an appraisal of damage caused by the pandoramoth. At the same time larvae were collected for rearing.

Life History and Habits

The pandora moth requires 2 years to complete its life cycle. The normal pattern from previous studies elsewhere indicates that the adults appear the latter part of June and July and the eggs hatch in August. In the Laguna area, it is believed that the moths emerge later in view of the observations made last year of their great abundance in late August. The eggs also probably hatch later; the 1957 record indicated that hatching was just beginning by mid-October. In other areas the young larvae hibernate in clusters in the foliage from late October to April 1. In Laguna this hibernation period appears to be much shorter, and it is possible that the larvae remain active most of the winter. Three larvae collected on March 29 were about half grown, averaging 30 mm. in length. On April 13, 33 were collected and when these were measured on April 16 they

averaged 58 mm. in length. The range in length for the latter sample was 45 to 67 mm.

Patterson studied the pandora moth in south central Oregon some years ago. In his report,1/ he presents a table showing the length of larvae on successive dates from April 1 to June 16. The comparison with the Laguna larvae is as follows:

Date	Average length (mm.) South-Central Oregon	Mt. Laguna	Range
Mar. 29		30	22-40
Apr. 1	23		
Apr. 14	28		
Apr. 16		58	45-67
May 5	33		
May 12	55		
June 6	60		
June 16	70		

The above data indicate that some of the Laguna larvae were nearly full grown on April 16 and about the same length as those reported by Patterson by the end of May. The Laguna larvae were caged with fresh ponderosa pine foliage in a box of sand on April 20, and at this writing several have entered the sand presumably to pupate.

The pandora moth at Laguna appears to be off cycle with other known infestations in the Pacific Northwest and the Rocky Mountain region, as well as with previous infestations elsewhere in California. The moth flight at Laguna occurs in odd-numbered years compared to even-numbered years in the other areas.

Amount of Defoliation

In the inspection of the Laguna area on April 13, larvae could be found on nearly every Jeffrey pine tree under 20 feet in height; but the population was relatively light, ranging from 1 to a maximum of 9 per tree. Three different areas were examined. One was the area around the Guard Station, a second along the main highway about a mile north of the station, and the third west of the new air force highway near Laguna Meadows. It was very difficult to detect the effect of defoliation, and there was no indication of conspicuous stripping of needles. However, Patterson found that the bulk of the feeding occurred in the mature larval stage when during the last two weeks of their development each larvae ate an average of 21 needles per day. Because of the low population of larvae per tree, it is not anticipated that any serious defoliation will result in 1960.

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1/ Patterson, J.E. 1929. The pandora moth, a periodic pest of western pine forests. U.S. Dept. Agr. Tech. Bul. 137, 20 pp., illus.